

Thunderstorms and Lightning

According to NOAA, from 1959 through 1994 West Virginia experienced 108 deaths attributed to lightning. West Virginia's "Lightning Alley" (shaded in red on Figure 4.1A) is an area along the Ohio River, which includes the counties of Jackson, Wood, Pleasants, Ritchie, Tyler, and Wirt. This region receives an average of six to eight cloud-to-ground strikes per square kilometer every year. (www.wvlightning.com, 2003)

A thunderstorm is formed from a combination of moisture, rapidly rising warm air, and a force capable of lifting air such as a warm and cold front, a sea breeze, or a mountain. All thunderstorms contain lightning.

Thunderstorms may occur singly, in clusters, or in lines. Thus, it is possible for several thunderstorms to affect one location in the course of a few hours. Some of the most severe weather occurs when a single thunderstorm affects one location for an extended time. Thunderstorms can contribute to an onslaught of other hazards, such as, flooding (Section 3.2), strong winds, tornadoes (Section 5.1), hail, and lightning, as well as the possibility of a lightning-initiated fire (Fires, Section 8.1).

Lightning is a major threat during a thunderstorm. In the United States, 75 to 100 Americans are hit and killed each year by lightning. Lightning is an electrical discharge that results from the buildup of positive and negative charges within a thunderstorm. When the buildup becomes strong enough, lightning appears as a "bolt." This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning reaches a temperature approaching 50,000 degrees Fahrenheit in a split second. The rapid heating and cooling of air near the lightning causes thunder.

Hazard Terminology

Thunderstorm – A cloud that contains lightning and thunder.

Severe Thunderstorm – A thunderstorm that produces hail at least three-quarters of an inch in diameter, has winds of 58 miles per hour or higher, or produces a tornado.

Lightning – The flash of light produced by a discharge of atmospheric electricity from one cloud to another or from a cloud to the earth.

Thunder – The sound that follows a flash of lightning and is caused by sudden expansion of the air in the path of the electrical discharge.

Hailstones are balls of ice caused by water droplets caught in updrafts, freezing the water. Hailstones can vary in size from small balls of less than 2 cm to large hailstones as large as baseballs. Crops are usually the most severely affected victims of hail, but windows and vehicles are also threatened. West Virginia has experienced severe hailstorms, but no recorded event has produced a state- or federal-level disaster.

While thunderstorms with hail and lightning can be found throughout the United States, thunderstorms can lead to some of the worst disasters such as flood, tornadoes, and fire. All of these are dealt with separately. The remaining storm effects, namely lightning and hail, are among the least of West Virginia's hazards.

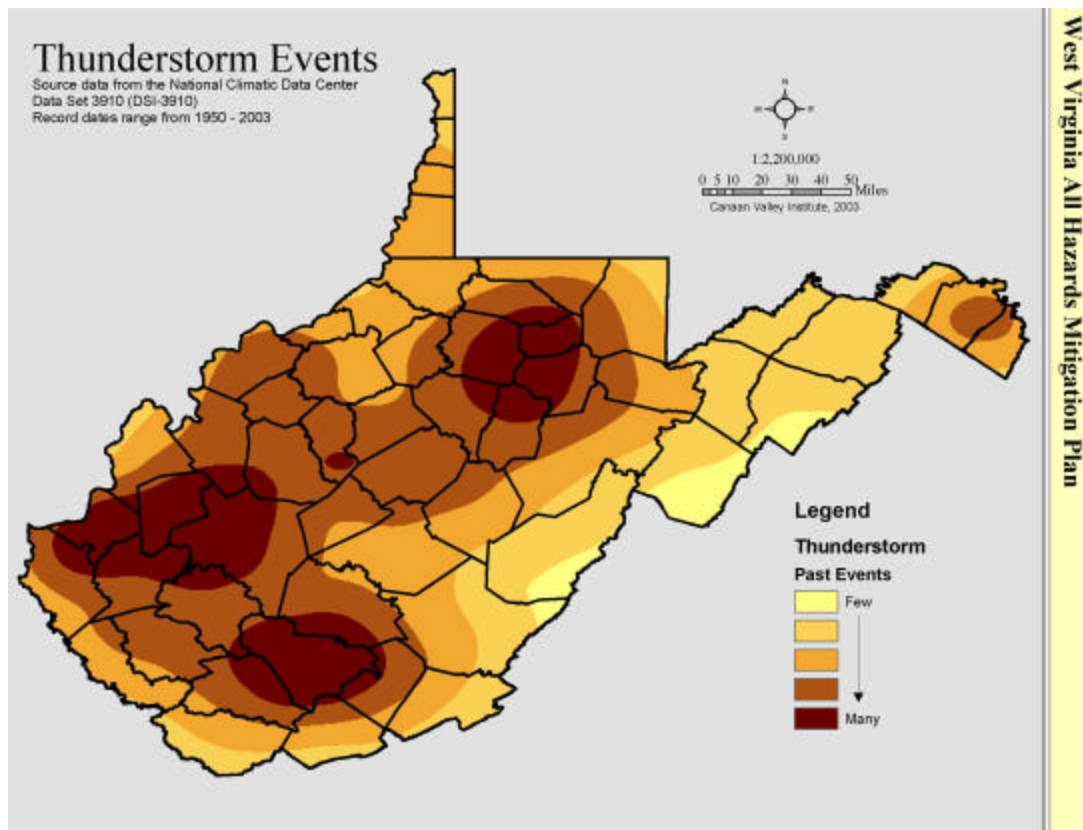


Figure 4.1B: Map of West Virginia Thunderstorm Events

From the West Virginia All Hazard Mitigation Plan, West Virginia Office of Emergency Services

WVU Extension Service Disaster and Emergency Management Resources
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